



udStream User Guide

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To learn more about udStream and other Euclidean solutions, please email sales@euclidean.com or visit us at <https://www.euclidean.com>.

Convert

The udStream enables users to import 3D models and convert them to Euclidean's Unlimited Detail format (UDS). Euclidean's UDS format enables you to stream and load massive point cloud data sets. udStream Convert currently supports the following file types:



To access the Convert Window click this icon at the top of the scene explorer.

UDS, UDG, LAS, LAZ, SSF, FBX (Windows & Linux), PTS, PTX, TXT, CSV, XYZ, E57, OBJ, DXF, DAE, SLPK and ASC (Esri)

Convert To UDS

It is safe to close this modal. Your conversions will continue in the background.

Create New Job

Awaiting User Input | Tile_+004_+003.uds

Add Input File

Begin Conversion

C:\datasets\LAS\Tile_+004_+003.uds

...

Output Name

C:\datasets\LAS\Tile_+004_+003_temp/

...

Temp Directory

Convert Job Settings

Continue processing after corrupt/incomplete data (where possible)

Quick Partial Convert (to test Settings)

Retain primitives (textures, polygons, lines etc)

Point resolution: 0.010000

Override Resolution

SRID: 28355

Override Geolocation

Metadata

Author

Comment

Copyright

License

Attributes

Included Attributes that have been detected and will appear in the output

udRGB

udReturnNumber

udNumberOfReturns

Input Files (1 files)

Remove All Files

Use Detected Setting

Set All Sources

X

C:\datasets\LAS\Tile_+004_+003

Pending... 1,033,490 points estimated

Cartesian

Source XYZ

[Click here if you're having trouble converting.](#)

Convert Window



If you attempt to drag and drop the file to want to convert on to the Convert Window before typing in the Output Name path and filename, then udStream will report that the file type is not supported.

Steps to convert

1. Create a Job. Begin by creating a new job, or simply by adding a new file. Drag and drop a file will automatically start a new job. You can add multiple files to a job, and convert will collate them into a single file.
2. Add a supporting input file by clicking "Add Input File" or dropping a support file onto the window. Input files using the FTP, HTTP, HTTPS protocols are supported.
3. Type in the Output Name path and name of the exported UDS file. Ideally, this parameter should be the final target location of the file so that you do not need to copy the file at the end. The system will add the file extension for you.

Make sure there is enough space in the target directory to store the entire converted file.

4. Type in the Temp Directory Defaults to the same location as the output file in the previous step. Type C:\udStream\convert in the Output Name field and the Temp Directory will default to C:\udStream\convert_temp. Euclidean recommends setting the Temp Directory location to one that resides on a high-speed local drive with plenty of space (rule of thumb: set aside as much space as the uncompressed raw input, as the points in the temporary files have not as yet been compressed), as the convert process will write many small, temporary files. The conversion will remove the temp directory after completion.
5. Optional Selection: **Continue processing after corrupt/incomplete data (where possible)**. If corrupt or incomplete data is detected during a conversion, this setting will decide whether the conversion is cancelled (unticked) or continues (ticked) resulting in a skip of the corrupted points. NOTE: If you tick this setting, the system will not report that it found corrupt or incomplete data.
6. Optional Selection: **Quick Partial Convert** Enabling this option will greatly speed-up the conversion process by only processing 1 in every 1000 points of the input data. This is useful for testing and calibrating the conversion settings before attempting to convert a large and time-consuming job. When imported into the scene the converted model will appear disintegrated and will have 1/1000th of the intended resolution.
7. Optional Selection: **Retain Primitives, (texture, polygons, lines etc)**. This option sets the convert context up to retain rasterised primitives such as lines/triangles to be rendered at finer resolutions at runtime
8. Optional Selection: **Override Resolution**. Set to the source size, or it will default to 0.01 if no source size configured. This setting determines the size of the points (in meters) in the point cloud after conversion. It will attempt to find a good size based on the source data but can be set manually by first ticking the "Override Resolution" checkbox and then typing a value in the text field.
9. Optional Selection: **Override Geolocation** If the source data has been correctly geolocated, when you import that file prior to converting it, the file should already have the "Spatial Reference Identifier" (SRID) information filled in this box: search for "EPSG code" or "SRID code" in the metadata. The SRID is the Geotagged ID of the GIS zone for the exported model. If the pre-parse can detect the SRID it will be set automatically. If not, and you wish to correctly geolocate your data, then you can manually select the "Override" checkbox and enter the correct SRID in the text field. It assumes that the input is already in the correct zone. Global Point Offset can be used to add an offset to the x, y and z coordinates of the converted model from that which was specified in the file's metadata, or if not, from the global origin (0, 0, 0).
10. **Metadata**. This section allows you to add related information to the metadata of the output file, such as Author, Comments, Copyright and License holders. The "Copyright" field will be displayed in the bottom of the screen when the model is in the scene. The standard attributes are prefixed with "ud".
11. **Attributes**. This section allows you to remove attributes that were detected in the inputs. Clicking an attribute will remove it from the output, clicking it in the ignored list will bring it back to the included attributes.
12. **Set All Source XY**. The source x and y values can mean a variety of things, for example latitude / longitude, or simply cartesian coordinates. This sets the source x, y values for all files.
13. **Source XY**. Sets the source x and y for a particular file.
14. Input Files panel. The estimated number of points in each file will be shown. During conversion, the progress for each file will also be shown. Here you can also remove any unwanted files.
15. Begin Conversion. udStream will read the file then process and write the points.

The  button beside the convert job in the "Convert Jobs" section allows you to cancel a running convert (it will cancel at the next 'safe' point and clean up temporary files). Once cancelled, the 'Begin Convert' button and the configuration options will reappear enabling you to restart the conversion. After a job has completed the  button also allows you to remove it from the list.

When the conversion has completed successfully, click the Add to Scene button located at the top of the window. udStream interface will automatically switch to the Scene Window to display your 3D model.

Euclidean does not recommend running multiple converts at the same time. Converting is a memory and processor intensive process so it is almost always faster to have 1 convert running at a time. udStream helps with this by allowing you to queue multiple jobs to run one after another.

Tiff conversion now supports world files. A tiff associated world file must have the same file name as the tiff, have the .tfw extension, and be located in the same folder. For example, the world file associated with D:\path\to\file.tiff would be D:\path\to\file.tfw

Tips for speeding up convert

1. The "Temp Directory" should be a local folder on a fast drive, ideally not the same drive as the output UDS.
2. Copy the inputs locally rather than loading them over the internet

Converting from Command Line (CMD)

udStream also comes with a separate command line application which allows you to convert files via the command line instead of using the Convert Tab.

The basic syntax is

```
`udStreamConvertCMD.exe server username password [options] -i inputFile [-i anotherInputFile] -o outputFile.uds`
```

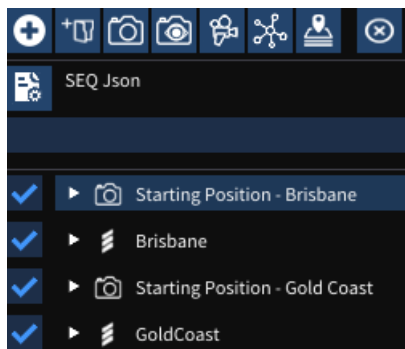
Here is an example of what you might see when doing a simple convert of a file 'POINT_CLOUD.csv' to 'myDataset.uds'.

```
`D:\EuclideanConvert>udStreamConvertCMD.exe https://udStream.euclidean.com username password -i ".\POINT\CLOUD.csv" -o "myDataset.uds"`
```

More information on the possible options is shown in the command line when running the udStreamConvertCMD application with no additional parameters

Scene Explorer









The Scene Explorer window lists the assets currently in your scene.



Action Bar

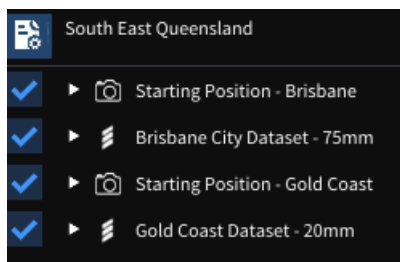


The buttons across the top of the Scene Explorer allow quick access to add or remove from the scene.

-  **Add Scene Item** This button opens the dialog box to add a new UDS, OBJ, SLPK, etc item to the scene. The Path/URL can include files on the local drives, network drives, UNC Paths, HTTP, HTTPS, FTP & FTPS.
-  **Add Folder** Adds a folder to the scene explorer. This can help with organizing your scene.
-  **Save Current Camera** Saves the current camera position and rotation as a viewpoint.
-  **Save Current Camera with Visualisation Settings** Saves the camera as above, along with the current visualisation [settings](#)
-  **Add Flythrough** adds a new [flythrough](#) to the scene.
-  **Add GTFS** adds a new [GTFS](#) to the scene.
-  **Add Place Layer** adds a new [Place Layer](#) to the scene.
-  **Remove Selected** deletes all selected items from the scene.

Scene Items

The area below the quick menu displays the items in the scene.



Selecting Items

Click on an item in the Scene Explorer to select it. Selected items will appear highlighted.

You can select multiple items in the scene explorer by holding Ctrl and then left-clicking them individually, or shift-clicking to quickly select larger groups. Doing this on a selected item will deselect it.

Single clicking without Ctrl will deselect all items and select just the item you have clicked.

Filtering Items


Items can be filtered by name or type, these can be specified above the list of items. Items that are filtered out will not be selected when performing a shift-click selection (see above).

Reorganising the scene

Items or groups of items in the scene explorer can be reordered by holding left-click and dragging them around. A blue line indicates where the item(s) will be after you release them.

Loading UDS Models

There are two ways to add models to the scene.

1. Drag and Drop
 - On devices with folder exploring you can drag a file from your file explorer and drop it in the scene window to add the model to the scene.
2. Direct URL loading
 - You can type a URL or path in the  "Add Scene Item" popup. The path field at the top of the pane allows URL and network paths to retrieve UDS files.

Scene Item Properties

Items in the Scene explorer (see Scene Items) can be expanded to give additional information (see below). The type of information displayed depends on the scene item.

UDS Point Cloud

The expanded properties for UDS files show the path the UDS was loaded from and then a tree view of the internal metadata from the file.

Path: https://az.vault.euclidean.com/GoldCoast_20mm.uds

542092.883852	6902549.639120	132.488930	Model Position
-0.000000	0.000000	-0.000000	Model Rotation
41943.040000			Model Scale
Default			Display Mode

Metre Scale: 1.0000

LODs: 21

Resolution: 0.0200

Attributes (1 total)

- udRGB
 - [AttrMinMax_udRGB] "0,4294967295"
 - [Units] "meters"
 - [ProjectionID] "EPSG:28356"
 - [ProjectionWKT] "PROJCS["GDA94 / MGA zone 56",GEOGCS["GDA94",PRIMES["GDA94"],UNIT["metre",1],AXES["Easting",1,"Northing",2]]]
 - [Watermark] "iVBORw0KGgoAAAANSUHEUgAAQAABZCAYAAAE"
 - ▶ convertInfo [Object]
 - [SourcePointCount] 57,314,316,092
 - [UniquePointCount] 49,585,860,515
 - [ConvertSeconds] 38,306
 - [ModelAttributes] "udRGB:u32"
 - [ModelBlendTypes] "Mean"

The system displays advanced information like the attributes in the file, their sizes, and how they are blended for level of detail calculations.













Comparing Models

You can compare two models currently loaded in the scene that were scanned at different times. The model you select in

the scene explorer will be the model that will have a distance calculated from each point to a mesh of the model you will select in the steps below. Please note that this process will generate a third model, representing the comparison between the two entered models.

1. Right-click on a model in the scene explorer
2. Select the **Compare Models** option
3. Enter the required information
 - a. Model to compare against. When doing a comparison between models from two different dates, this will be the older of the two models.
 - b. Ball radius (in metres), this is used to mesh the point cloud. This should be the maximum distance between two points that could be considered part of the same surface.
 - c. Grid size (in metres), this is used to split the model up into smaller pieces for processing. This will be the maximum distance a point can be from a point in the old model, points that sit outside all the grids will be displayed with the "No Match" colour when using the displacement visualisation options.
4. Click the **Compare Models** button, this will create a convert job and open the convert window. See [Convert](#) section for more information.

Workflow













-  **Profile Menu:** Access your profile, change password, export project, sample projects, or to log out.
-  **New Project:** Allows to create a new project, either geolocated or non-geolocated, or choose a sample project.
-  **Open Project:** Allows to create a new project, either geolocated or non-geolocated, or choose a sample project.
-  **Save Project:** Saves the project to a chosen destination.
-  **Share Project:** If your the current project is saved on the cloud, you can share it with others.
-  **Convert** opens a popup to [convert](#) datasets into the UDS format
-  **Show/Hide Scene Explorer:** Toggle the [scene explorer](#) window
-  **Toggle Viewport** opens a second view that can be controlled independently or used to display a top-down map view that is synchronised with the main viewport.
-  **Open Settings:** Opens the [Settings](#) window.
-  **Show User Guide** opens the [user guide](#).
-  **Help:** Opens the help drop down.
-  **Return Camera** Returns the camera the initial starting view.

Tools

udStream has a range of tools to help you with your workflow.



> (Above) Height measurement tool

-  **Selection Tool** is the default tool when no other tool is active. It allows you to select items in the scene.
-  **Voxel Inspector** allows you to inspect the data associated with individual voxels of a UDS file.
-  **Single Annotation Point** You can add multiple annotation points to the current scene, and alter the name and colour of each annotation point. Simply click on the POI (Point Of Interest) button in the tool bar on the left and click in the scene. Clicking on the POI in the Scene Explorer will give you options to change the size and colours of the displayed text. Right clicking on the POI name in the Scene Explorer will bring up a context menu, where you can edit the POI name, move the camera to the POI in the scene, or remove it.
-  **Line Measurements** (see [Measuring](#))
-  **Area Measurements** An Area Measurement is used to measure the horizontal area described by 3 or more points. The function is almost identical to the Line Measurement, the only difference being the resulting polygon is closed by default.
-  **Height Measurements** The height measurement tool is useful when you wish to measure the height, and horizontal distance between two points. Click the height measurement tool from the tool bar on the left-hand side. Click on a point in the scene. Click on a second point to anchor the height measurement.
-  **Box Filter** Adds a [box filter](#) to the scene
-  **Sphere Filter** Adds a [sphere filter](#) to the scene
-  **Cylinder Filter** Adds a [cylinder filter](#) to the scene
-  **Cross Section** Adds a [cross section](#) to the scene
-  **Add View Shed** Adds a [viewshed](#) to the scene
-  **Add Media** Adds a media node to the scene

Compass



Clicking this button will also face the camera north.

Lock Altitude



Hotkey: **spacebar**

Will keep the camera's height constant (Z-axis lock) when panning with the mouse or strafing with the keyboard.

Map Settings



A shortcut to open the map section in the [settings](#)

Visualisation Settings



A shortcut to open the visualisation section in the [settings](#)

Fullscreen



Hotkey: **F5**

Toggle fullscreen mode.

Image POI

To add an image at a specific location, simply drag and drop a png, jpg or a tiff into the scene.

- **Image Type** Use Image Type to select how you want the image to be displayed:
 - Standard will display the image as a billboard, that is, always facing the camera
 - Orientated Image will allow you to change the orientation of the image
 - Panorama will project the image onto a panoramic cylinder
 - Photo Sphere will project the image onto a sphere
- **Thumbnail Size** The size the image will be displayed in the scene
- **Reload Time (secs)** Reload Time allows you to control how often the image is updated in the scene. This is useful if the image changes over time and should be updated in the scene.

FAQs

Why can't I see my model?

Ensure the model is enabled: a tick should appear in the tickbox next to the model name in the Scene Explorer window.

How do I lock altitude when moving the camera?

Press the Space bar to toggle or press the lock altitude button in the 'status' window (bottom right of the Scene window). See Scene Info and Controls (in [Settings](#)) for more information.

How do I load my previous projects?

You can load a project that you saved to disk by clicking the Import button at the top of the window and browsing to where you saved your project.json file.

How do I convert into UDS?

Select the Convert window and type the destination path and name for the converted file in the Output Name field (the system will add the .uds extension once you click out of that field if you don't enter it). Drag and drop the file you want to convert on to the Convert window. Fill out other fields as required. Refer to Convert in this guide for detailed instructions.

A converting error occurred, what do I do?

Due to either corrupt or incomplete data, clicking the 'Continue processing after corrupt/incomplete data (where possible)' tickbox will let the conversion process know that it should attempt to complete the convert process, ignoring data integrity. Euclidean cannot guarantee that the model will convert correctly or that if it does, it will be a useful rendering.

I am dragging my file to convert onto the convert window, but nothing is happening. What do I do?

Confirm that the file type is supported for conversion by udStream.

I want to demonstrate key features of my 3D model, how can I do that?

Check out the Visualisation category under [Settings](#).

How do I adjust the mouse controls?

View Mouse Pivot bindings in the Input and Controls menu in [Settings](#).

My 3d object is hidden behind the map. How do I see it?

Changing the Transparency or the Blending in Maps and Elevation (in [Settings](#)) may make it easier to see your object, using a combination of these for varied affect.

I keep getting the "logged out" screen, how do I fix this issue?

Check your internet access and try again.

I cannot log in

Check your internet connection, and ensure you have used the correct URL, username, and password. Make sure your URL has a closed bracket at the end of it if using the default server URL.

I cannot connect to the udStream Server, how do I resolve this issue?

Check your firewall or proxy settings. If running a proxy, check with your IT department that the address is correct and that the correct port is set.

My proxy is not working, why?

Adopt the proxy format of protocol://username:password@domain/URI. Network metadata is not transmitted when using proxies and is stored in plain text file, which may assist solving connection issues.

Could not open a secure channel. Why is this popping up?

If you are using a proxy, your network may not be sending encrypted data. Ticking the "ignore certificate verification" may circumvent this issue. Note: Network Security certificates will not be verified.

Technical Requirements

- udStream OpenGL: Requires OpenGL version 3.2 and up-to-date graphics drivers.
- udStream DirectX11: Requires DirectX 11 and up-to-date graphics drivers.
- A reliable Internet Connection with adequate bandwidth.
- A valid License is needed to unlock the Premium features of udStream

Third Party Licenses

udStream uses a number of third party libraries. Goto Scene Profile Menu > Settings > About for full license information.

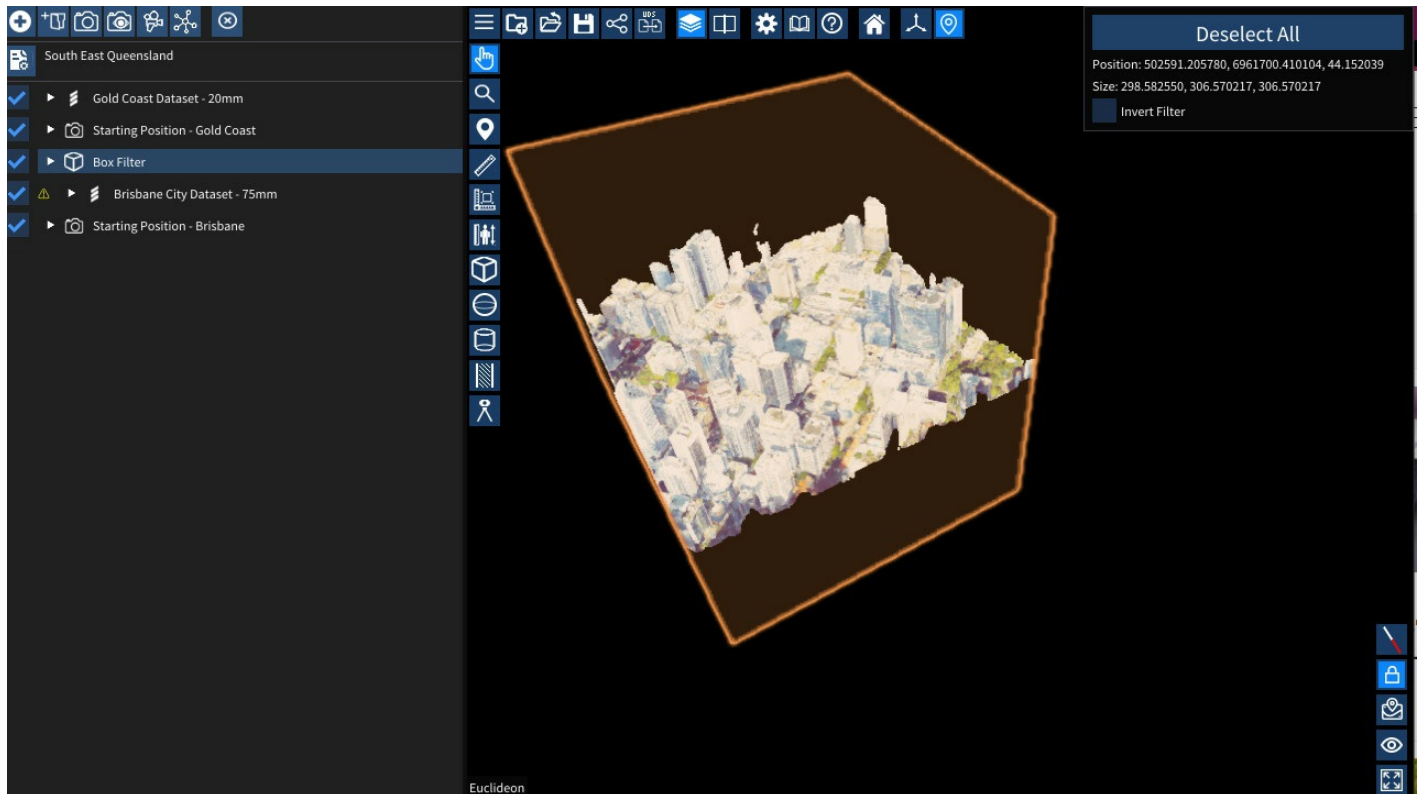
- Dear ImGui from [GitHub](#)

- ImGui from [GitHub](#)
- libSDL2 from [libSDL](#)
- GLEW from [SourceForge](#)
- Nothings/STB single header libraries from [GitHub](#)
- ImGui from [GitHub](#)
- easyexif available at [Euclidean's GitHub](#) forked originally from [GitHub](#)
- Autodesk FBX SDK from [Autodesk FBX SDK Download Page](#)
- Atmosphere from [Evasion](#)
- Poly2tri from [Github](#)
- libtif from [GitLab](#)
- UTF-8 Decoder from [URL](#)

Euclidean udSDK uses the following additional libraries.

- cURL from [GitHub](#)
- libdeflate from [GitHub](#)
- mbedtls from [GitHub](#)
- miniz from [GitHub](#)

Filters



Filter Example

The various filters can be used to filter out voxels of the UDS files in the scene or during export. You can change the position, rotation and size of the filter by setting the appropriate values in the scene explorer. You also use the [gizmos](#) to adjust the transforms.

Tips for using filters

- The filter only applies to UDS files that are further down the list in the same folder (or subfolders) in the [scene explorer](#).
 - In the screenshot above, the "Brisbane City Dataset - 75mm" is filtered using the "Box Filter" but "Gold Coast Dataset - 20mm" is not as the Gold Coast dataset is above the Box Filter.
- The "CSG Operation" allows for complex filtering
 - Union will show voxels that match this filter OR the previous filter
 - Intersection will show voxels that match this filter AND the previous filter
 - Replace will override the previous filter and use this one for future models



Box Filter



Sphere Filter



Cylinder Filter



Cross Section Filter

Inverting the filters will remove everything outside the filter.


Exporting using filters

To export the filtered data, right click on the model you want to export in the Scene Explorer. Choose Export Pointcloud then choose the filter you want to export if you have more than one.

If the "Export Pointcloud" Option doesn't appear, ensure that you are using the model's projection by double clicking the model in the Scene Explorer, or right clicking the model in the Scene Explorer and selecting "Use Projection".

Paths, Flythroughs and Video Export

This feature allows you to capture, edit and export a 'flythrough' of the camera. To use:

- Select  **Add Flythrough** from the top of the scene explorer. You should see a window pop up in the scene.



- Click **Record** to start recording, and move around in the scene.
- Once you are done, Select **Stop**.
- You will now have an option to **Export** the flythrough with a range of options such as:
 - **Resolution**: 720p, 1080p or 4K
 - **FPS**: Frames Per Second
 - **Export Format**: Export as either a sequence of images, or a MP4 movie file
 - **Export Path**: The path you wish all export files to be placed

Opening the flythrough or *Camera Path* in the scene explorer will allow you to edit, remove and add frames to the flythrough.

Camera Path											
Smooth											
0.000000	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.076558 RH	-0.400411 RP	C	+V			
0.752896	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.076558 RH	-0.400411 RP	C	+V	X		
1.272377	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.076558 RH	-0.400411 RP	C	+V	X		
1.290844	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.080570 RH	-0.400411 RP	C	+V	X		
1.308082	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.087464 RH	-0.400411 RP	C	+V	X		
1.324229	T	301908.07111 PX	5643603.3989 PY	2973638.4029 PZ	2.095126 RH	-0.400411 RP	C	+V	X		

Each frame consists of the following elements:

- **T**: The timestamp of each frame
- **PX, PY, PZ**: The coordinates of the camera at this frame
- **RH, RP**: The heading and pitch of the camera at this frame
- **C**: Copy the current camera position to this frame's position
- **+V**: Add a new frame after this one
- **X**: Delete frame

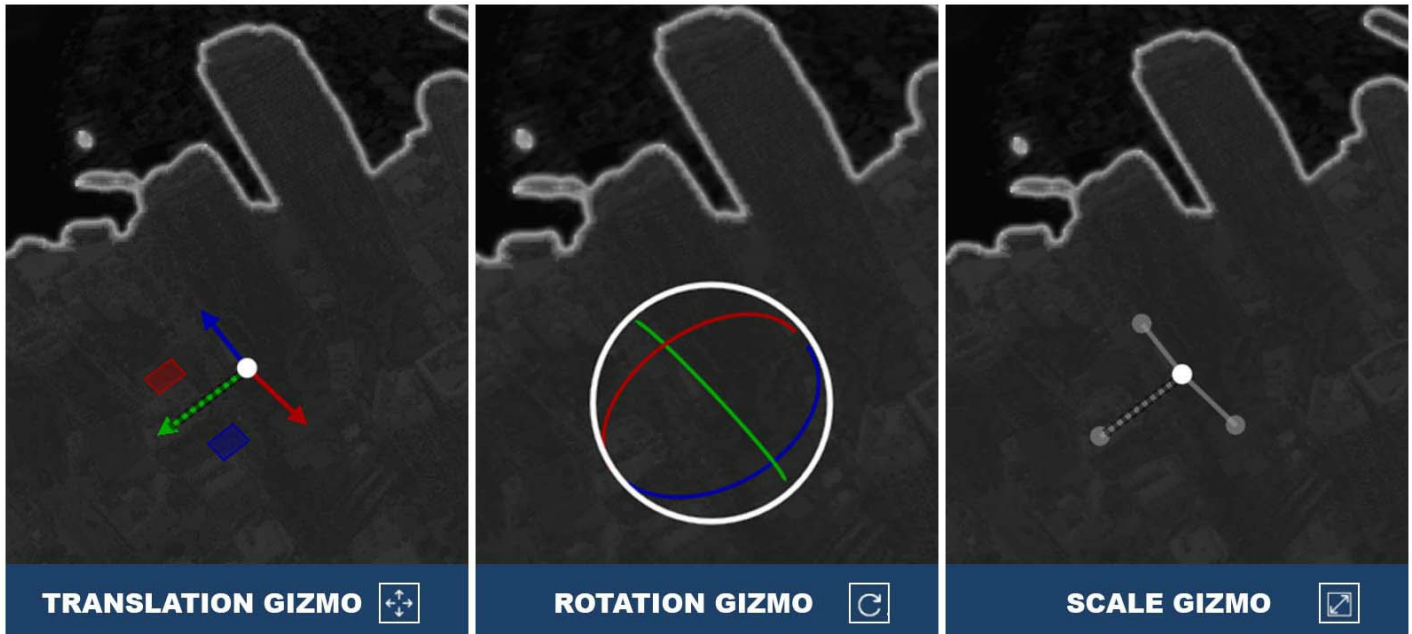
Additionally, select **Smooth** to smooth out the camera movement over all frames.


Gizmos

A "gizmo" is used to move objects around in the scene. When active, the gizmo appears at the origin of an item. Gizmos are disabled by default.

To activate the gizmo tool, do the following:

1. Select an item in the Scene Explorer window (see [Scene Explorer](#)).
2. Select a gizmo tool from the udStream interface (see [Scene Explorer](#)).



In Local Space Mode, the axis will align with the local axis of the last selected item. If the model does not have a local space axis, then the gizmo will use the global axis . Red is the X axis, which in projection space usually corresponds to the EASTING. Green is the Y axis, which usually corresponds to the NORTHING. Blue is the Z axis, which usually corresponds to the ALTITUDE. Looking at the gizmo from different angles will cause one or more of its axes to appear hatched/dashed. This indicates that this axis is pointed in the negative direction.



Negative angled gizmo

Use the Translation Gizmo to move scene item(s) around. The translation gizmo has 3 components:

1. The coloured axis arms of the gizmo will translate only along that axis.
2. The coloured squares between two axis arms will translate in that plane. For example, the square between the X and Y axes translates only in the XY plane. The colour indicates which axis will not be modified by using that square.
3. The white circle at the origin of the gizmo will translate the models in the plane perpendicular to the camera.

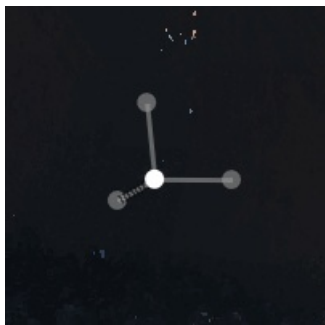
The Rotation Gizmo changes the orientation of the item(s). Items will rotate around their pivot point, which is ideally the centre of the mass. For UDS models, a pivot point is selected automatically during conversion. Non-UDS models can designate a different pivot point. The rotation gizmo has 2 components:

1. The coloured rings will each rotate around the axis of that colour (e.g. the Z-axis is blue, so the blue ring rotates everything around the Z-axis).
2. The white ring rotates everything around the axis parallel to the direction of the camera.

The Scale Gizmo changes the size of the selected item(s). The anchor for scaling is always the centre of the item(s). The scale gizmo has 2 components:

1. The coloured axis arms of the gizmo can be used to scale along that axis only.
2. The white circle at the origin of the gizmo will scale uniformly in all directions.

In some situations, you may find parts of the gizmo greyed out. This will happen when the model does not support that action. For instance, UDS files do not support non-uniform scaling. Therefore, that gizmo will be unavailable.




Scene gizmos greyed out

General Transit Feed Specification

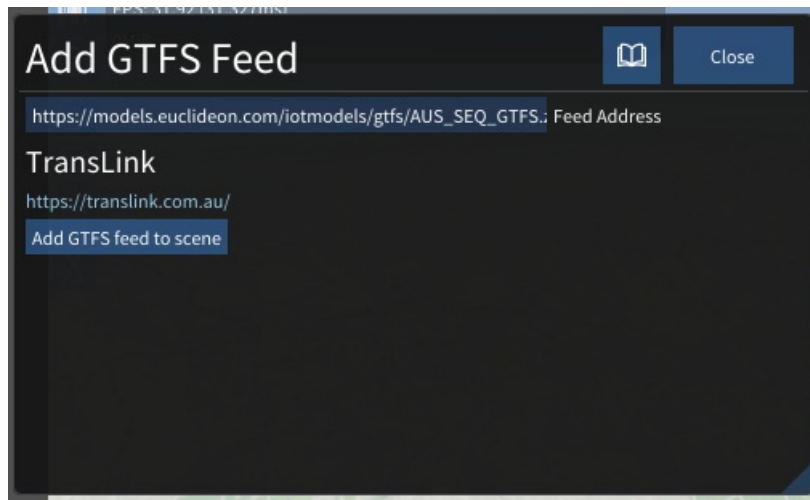
GTFS is a data specification that allows public transit agencies to publish their transit data in a format that can be consumed by udStream.

GTFS is intended for use by advanced users as it contains features that can cause performance loss if not configured correctly.

Setup

A GTFS feed can be added to the scene by clicking the  at the top of the Scene Explorer.

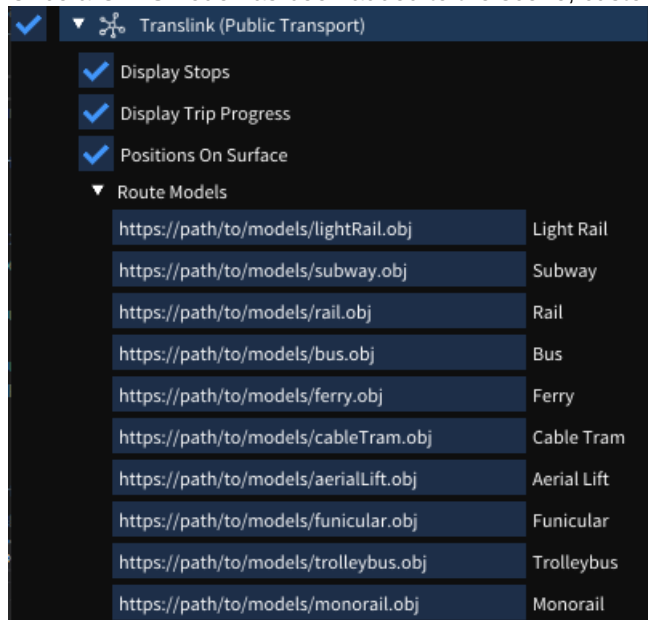
The following modal will be opened; the GTFS link should be to the .zip file of the GTFS feed.



After the feed is verified; the feed name and URL will appear and the "Add GTFS feed to scene" button will be enabled.

Customization

Once a GTFS node has been added to the scene, customization options will appear in the Scene Explorer window:



Stops

Enabling the 'Display Stops' option will display the stop information as labels in the scene viewer window. These stops can be individually selected (in the scene viewer window) to bring up additional information about that stop.

Trips

Enabling the 'Display Trip Progress' option will display trip information. Each trip has a type, and the system will render the appropriate model URL provided by the user in the 'Route Models' list.

For example, trips that have type 'Subway' type will draw the model provided in the 'Subway' input field.

Selecting a route model in the scene viewer will bring up additional information about that route, including its route path.

Other Settings

Enabling the 'Positions On Surface' option will query the system for height information for each trip, placing it on the surface of the maps (if DEM is enabled).

Note! This is an expensive operation, and should be used with caution.

Hosting a model

You can store 3D models on:

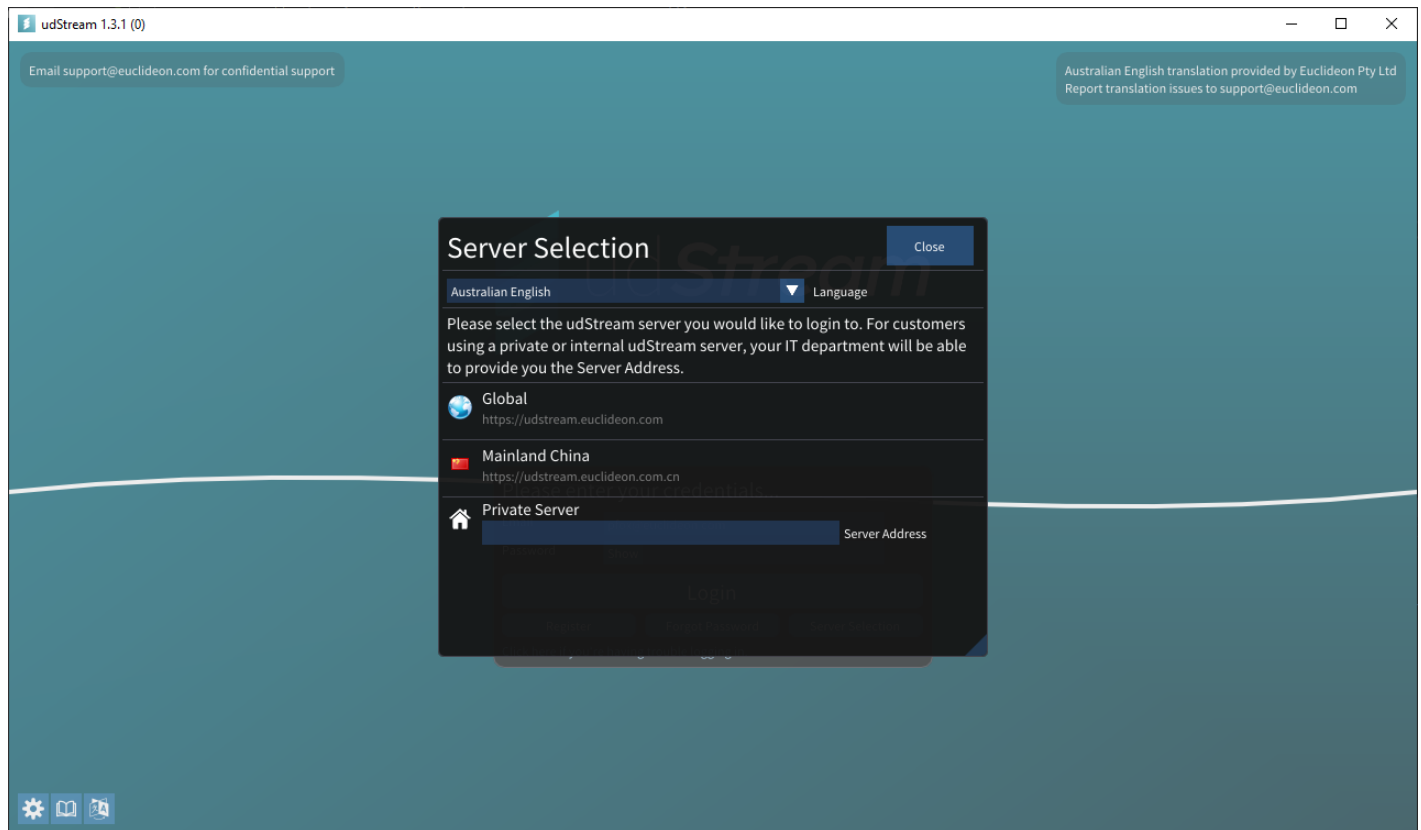
1. A local computer hard-drive
2. A network drive
3. In the Cloud.

Detailed configuration and implementation instructions on how to host models in a cloud is outside the scope of this document. Please, refer to the Euclidean Server and udSDK Guides for more information.

Logging into udStream

After the application has started, it will present the login or server select screen. If this does not occur, please contact support@euclidean.com for assistance.

Selecting a Server



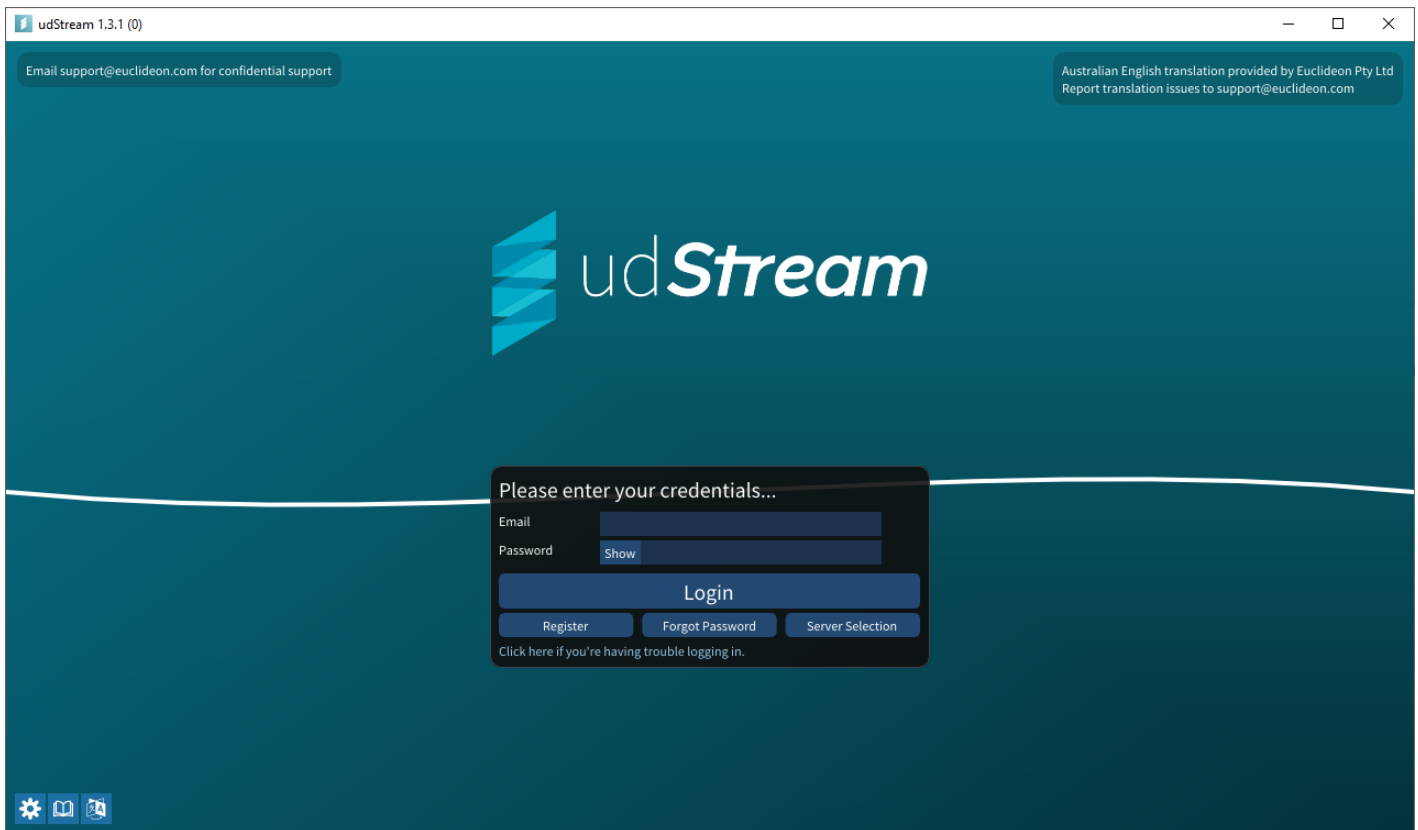
If the server selection modal does not appear by default, it can be opened by clicking on "Server Selection" on the login screen.

The public servers hosted by Euclidean and it's distribution partners are listed as options that can be clicked to be selected.

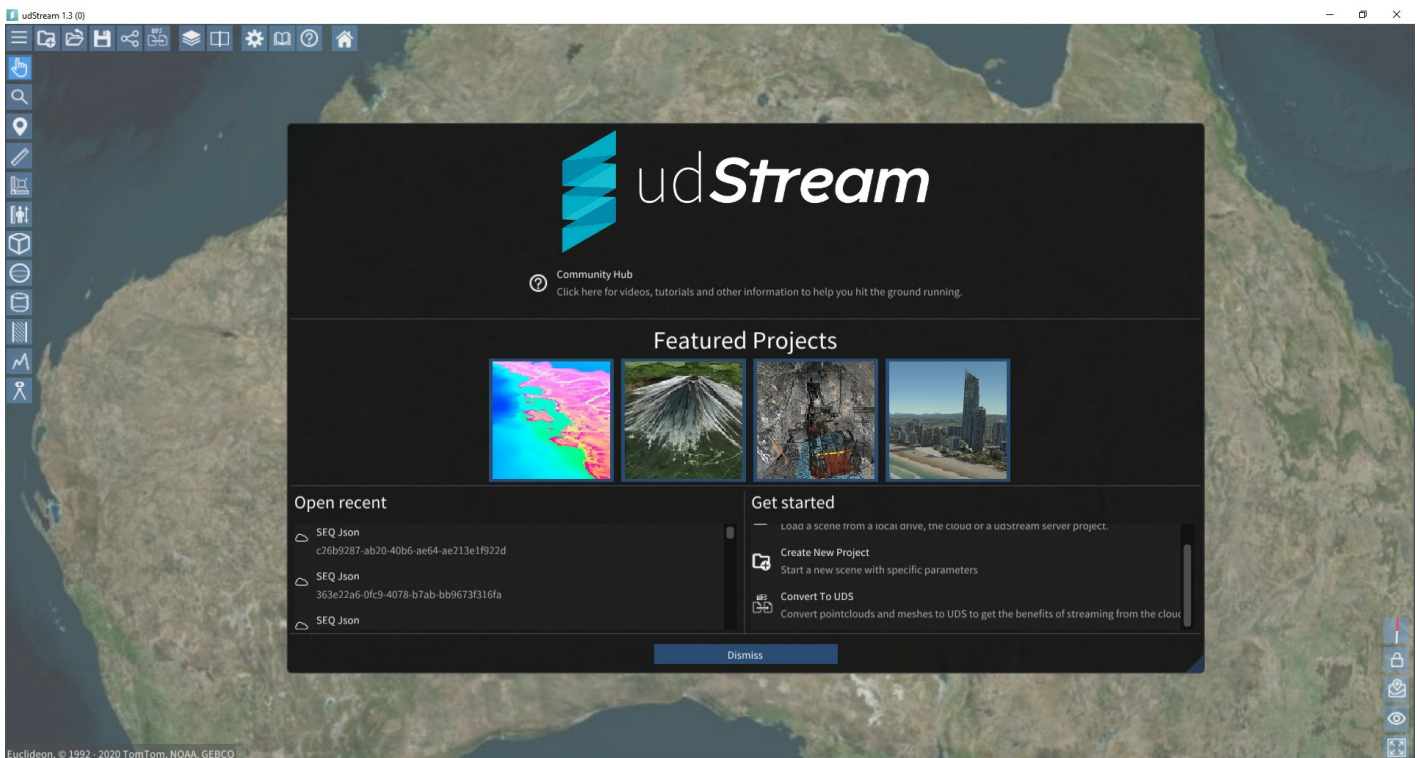
A server address can be entered in the text box and the "Close" button in the top left allows for the modal to be closed.

As this modal appears when the program is first launched, it is also possible to override the default language selection on this screen.

Login Screen



After you have entered your credentials, click Login and you should see an empty scene in the viewport like the image below (actual opening scene may vary).



Login Errors

Could not connect to server.

- There are several possible causes for this message. The most common is the Server URL entered into the field is not correct. The system is case- and space-sensitive. Ensure there are no spaces before or after the Server URL.

Username or Password incorrect

- This could mean any of the following:
- The username or password is incorrect
- The username does not exist
- The username has been banned

- You need to ensure there are no unintentional spaces before or after the Username or Password.

Your clock does not match the remote server clock.

- To maintain system security, the client and server must agree on the time to within 5 minutes. Having the server and client both set to synchronize with "universal" NTP time is preferable. This error will occur if the time zone of either the server or the client is not set correctly.

Could not open a secure channel to the server.

- The client was able to connect to the server provided in the server URL field, but an error occurred while verifying the server was the intended target or negotiating an encrypted connection.

Unable to negotiate with the server, please confirm the server address.

- The client was able to connect to the server provided in the server URL field, but the server did not respond as expected. This usually occurs if the server is not a udStream Server.

Unable to negotiate with proxy server, please confirm the proxy server address

- This occurs when the proxy information is partially correct. Further details may be required before the connection through the proxy is correct (usually proxy authentication details).

Unknown error occurred, please try again later.

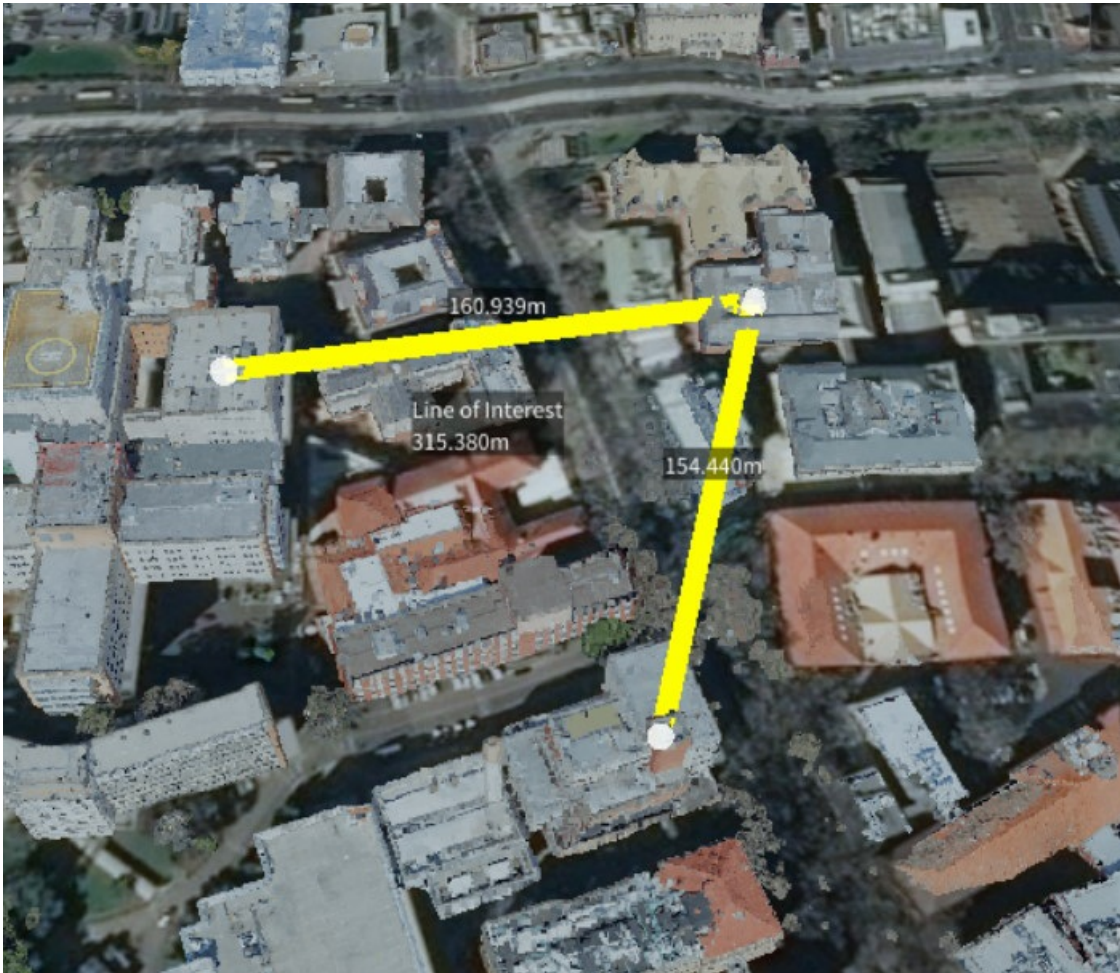
- This error was not one of the above errors and will require Euclidean Support assistance to resolve. Please contact Euclidean at support@euclidean.com or go to <https://euclidean.com> to access our online support and Knowledgebase.

When an error occurs, press the Alt and Ctrl keys simultaneously to display an additional error code after the message. Email support@euclidean.com, giving the udStream version number, error message and code so they can help you resolve the problem. You might use this in situations where you get an Unknown Error Occurred message.

Measurements

A Line Measurement is a series of connected points in the scene, useful to visualise boundaries and measure distances.

To begin a line measurement click on the line measure icon in the tool panel and click in the scene to place line nodes. A panel will appear in the top right with a few options, and information about the line measurement. See below for a description.



- **Show Length** Display the cumulative length of the line segments.
- **Show All Lengths** Display the individual lengths of each of the line segments.
- **Show Angles** Display the angles between joining line segments.
- **Show Area** Display the area encompassed by the line segments. The area is calculated by first meshing the point set, then totaling the area of each triangle in the mesh. To give a correct area, the shape should be simple, that is cannot contain lines that cross over. Note: the Close Polygon option must be selected for an area to be calculated.
- **Close Polygon** Join the first and last points, thereby creating a 'closed' shape.
- **Line Width** Set the width of the line in the scene.
- **Line Orientation** There are three options to choose from: Screen Line, Vertical/Fence and Horizontal/Path. The Screen Line is simply a basic single-colour line drawn on the screen. The Vertical/Fence and Horizontal/Path options with create a vertical and horizontal oriented line object, respectively. These options are helpful when looking at the line from different angles.
- **Line Colour** Set the colours of the line.
- **Selected Point** Move the slider to select a node in the line. Once selected, you can manually change the position of the node by setting the x-y-z coordinates or remove the node from the line. A value of -1 selects indicates all points are selected.
- **Text Colour / Background Colour** Set the colours of the text displayed along the line in the scene.
- **Description** Add a description to the line. This will be saved out with the project.

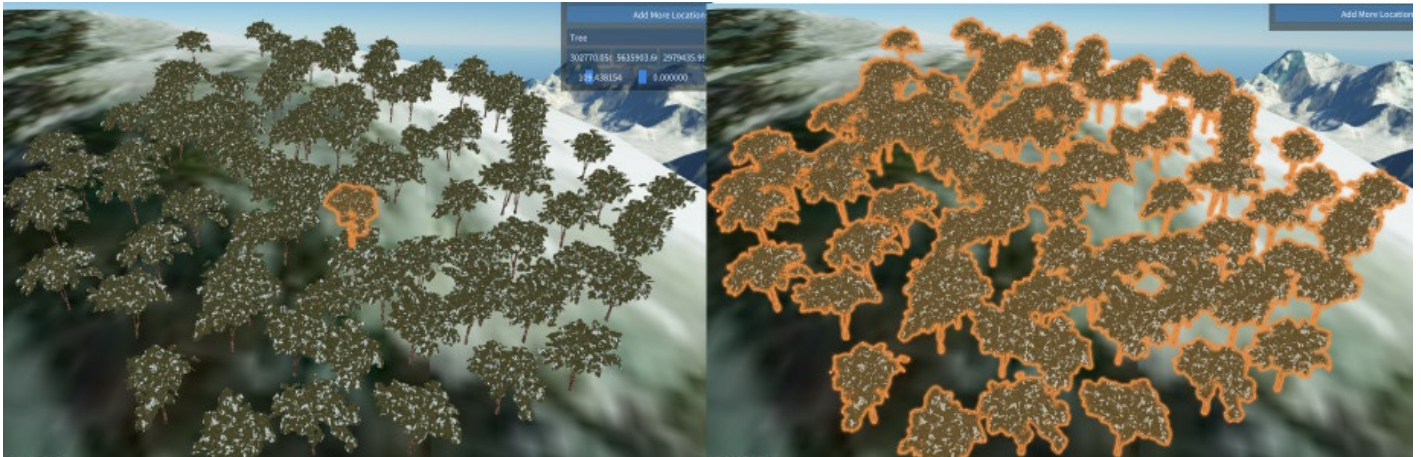
Right clicking on the name in the scene explorer will bring up a context menu with additional options.

- **Edit Name** Change the name of the line.
- **Move To** Move the camera such that the line is in view.
- **Fly Camera Through All Points** This option will begin a fly-through of all points along the lines. The fly-through speed is determined by the Camera Move Speed. If the Close Polygon line setting is checked, the fly-through will repeat until cancelled.

- **Attach Model** A model can be attached to a line, and will continuously move along the segments of the line. This is useful for vehicle or flight paths. Once attached, more options will become available in the scene explorer under the respective line. These are used to control the speed of the model and set the type of face culling.
- **Remove Item** Deletes the item from the scene.

Places

A place layer is a collection of points that can be displayed with a label, a model or both.



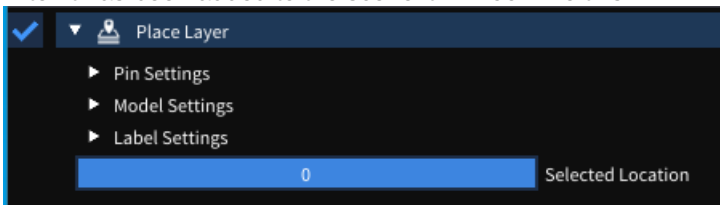
Many Trees in a single Place Layer

They are intended to be used in when at least one of the following situations occurs:

- There is a requirement to display multiple copies of the same model in an efficient manner (trees, parking meters, stop signs, etc) or;
- A lot of related annotations that the user would like to be able to enable and disable in a single layer.

Adding a new place layer can be done by clicking the  Add Place Layer button at the top of the [Scene Explorer](#).

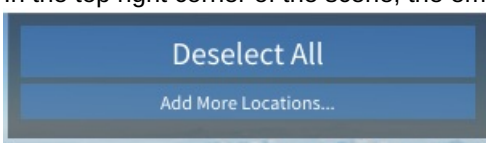
After it has been added to the scene it will look like this:



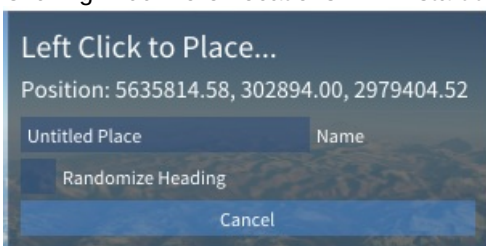
Adding more Places

To add more places to the scene, follow these steps.

1. In the scene explorer, expand the Place Layer you want to add points to
2. In the top right corner of the scene, the embedded UI will display



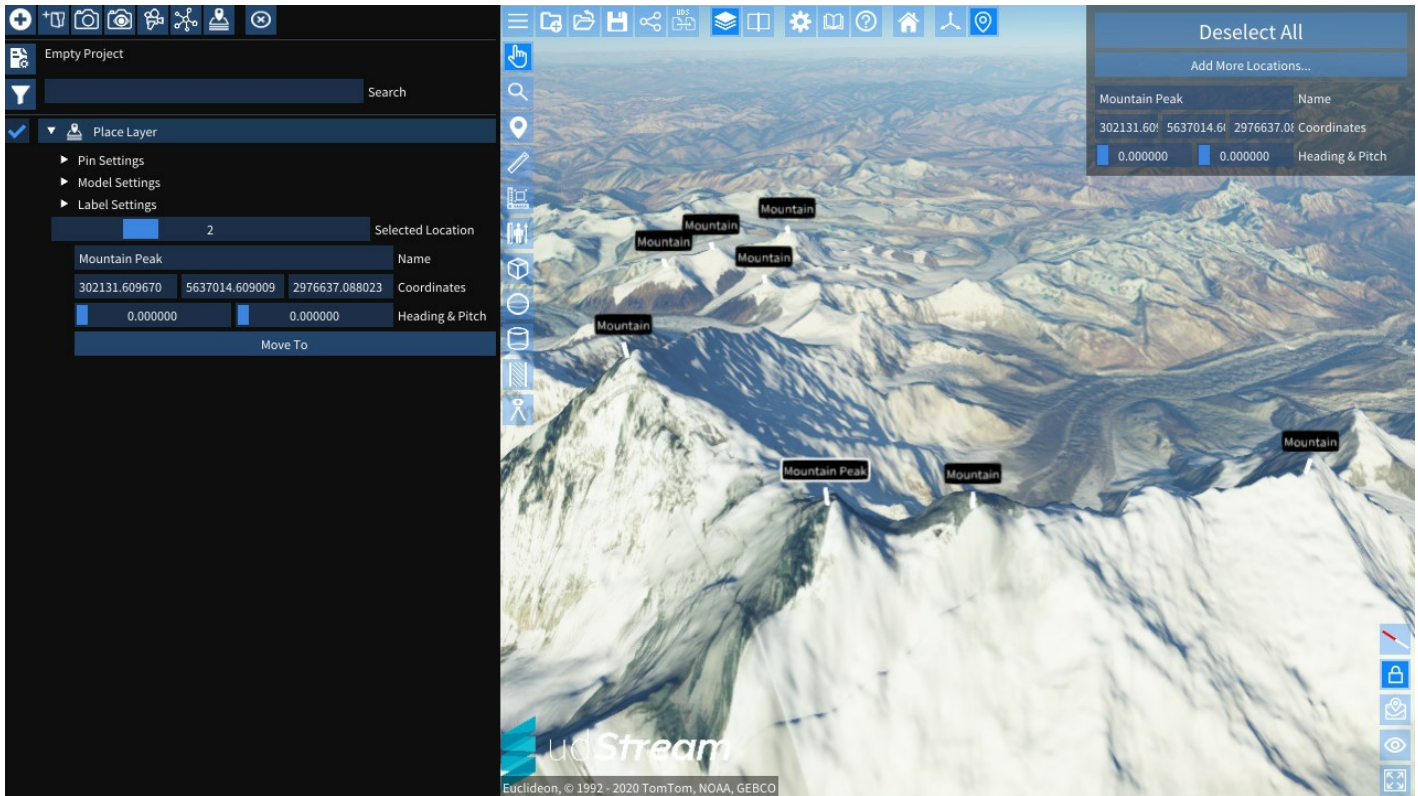
3. Clicking "Add More Locations..." will start the placement mode and the scene UI will now show this.



4. The "Name" field will be used to fill in the name of the places that are created.
5. "Randomise Heading" can be used to set the heading to a random value. This is particularly useful to avoid repetitive patterns when placing objects like trees or other vegetation.
6. Clicking in the scene will create a new place at that location.
7. To stop placement mode, press "Escape" (by default), start using a new tool (like Measurement) or click "Cancel" in the embedded UI in the top right of the scene

Updating the details on individual Places

There are two main ways to modify the details of an individual place.



Individual Place Selected

In the [scene](#):

1. Click on the label or model (as applicable) of the place that needs to be modified.
2. The model and label (as applicable) will highlight in the scene
3. The embedded UI in the top right of the scene will display the selected node where fine tuning can occur.

In the [scene explorer](#):

1. In the expanded options for the Place Layer, drag through the "Selected Location" slider until you find the desired item.
2. The Place can be modified immediately underneath the slider and the "Move To" button can be used to move the camera to the selected Place.

Note! With an individual model selected, it is possible to fine tune using the [Gizmo](#) controls.

Removing an individual Place

Sorry. This cannot be done from within udStream 1.3.1. A future version will add support for this.

Place Settings

There are 3 main groups for settings. The "Pin Settings", "Model Settings" & "Label Settings". These can be found in the [scene explorer](#) after expanding the Place Layer.

Pin Settings

The pin settings are used to control how the Places group together when far away.

- If the **Pin Image URL** is set, it will be displayed when Places are beyond the global "Maximum Label Distance" in settings.
- **Maximum Pin Distance** sets the threshold at which Places will no longer be represented using the Pin Image and will no longer be visible in the scene.

Model Settings

The model settings control the polygon model that is displayed at each Place.

- **Model URL** sets the URL for the polygon model, ensure that CORS is configured and users will be able to access the model. OBJ is the recommended format.
- **Model Position** moves the pivot for the model, this is necessary when the model is off-centre.

- **Model Rotation** is used to fix models that are not rotated so that X faces East, Y faces North and Z faces Up.
- **Model Scale** gives X, Y, Z controls to fix scale issues with imported models.
- **Tint** can be used to tint all instances of the model.

Note! As with all colour pickers, the gradient colour picker for **Tint** can be right clicked to enter HSV mode.

Label Settings

The label settings controls the

- **Show Labels** can be used to enable & disable the label entirely
- **Show Lines** will enable & disable the line between the Place position and the label
- **Label Height** sets the distance above the position that the label will display
- **Background Colour** changes the backing colour of the label. The "Alpha" channel can be used to have transparent labels.
- **Text Colour** changes the colour of the text on the label.
- **Line Colour** changes the colour of the line between the position and the label.

Importing Project Data

udStream supports importing project data from:

- Geoverse UDP
- CSV (Annotations only)
- 12DXML (excluding TINs)
- ShapeFiles (excluding TINs)

File Encodings

udStream supports UTF-8 encoded text files only. If you want to load a file in udStream that is not UTF-8, you will have to change the encoding. You can do this a number of ways but perhaps the easiest is to load the file in notepad in Windows, click 'File' and then 'Save As...'. Choose a file name and next to the 'Save' button set the encoding to UTF-8 and click 'Save'. This new file should now load in udStream.

12DXML support

udStream has limited support for 12dxml files. Drag and drop your file into udStream to load the file.

If the file encoding is not supported, you can change the encoding as described above or alternatively, in the software you created the file, export the project again as UTF-8.

Currently only a part of the 12dxml spec is supported. More features may be supported in future releases.

Check back, or if you have a specific request for a 12dxml feature, let us know at support@euclideon.com. Otherwise, udStream will try to convert a 12dxml file in the follow manner:

- All Models will be extracted and loaded as folders in the scene explorer
- Super strings from within models will be extracted and stored in the model folder. The following super string elements are supported:
 - 3D points and point lists will load as Annotations and Lines of Interest respectively
 - Both the data_3d and data_2d tag are supported
 - Names
 - Colours
 - The null and colour command is supported and can be set once per string

Scene Viewport

These settings are configurable in Input & Controls. See section [Settings](#).
You can use specific keys, with the "Scene" window focused, to control the camera movement.

Default Mouse Controls:

- **Tumble** Hold down the left-mouse button and move the mouse left-right-up-down to rotate within the display and change the angle of your view. You will not travel with the tumble action.
- **Pan** Holding the right mouse button on a point in the scene (not the skybox) will begin "panning" (moving the camera, but not turning the camera. It will keep the originally hovered point under the mouse cursor.
- **Orbit** Hold down the mouse scroll wheel as you move the mouse. The mouse movement will give you the sensation that you are orbiting around the point you selected. This feature is based on where you first click on the screen and will keep the camera the same distance from the clicked point by turning and moving the camera.
- **Dolly** The mouse scroll wheel will "dolly" (zoom the camera in and out) from the point where the mouse is hovering (will not work with the skybox).

If you prefer the Euclidean Geoverse MDM method of using the Scroll Wheel to change the mode speed, then that option is available in Settings > Input & Controls > Mouse Pivot Bindings.

Default Keyboard Controls

- **W and S** manoeuvre the camera forward and backward at the current Camera Move Speed.
- **A and D** pan the camera left and right at the current Camera Move Speed.
- **R and F** ascend and descend the camera at the current Camera Move Speed.
- **Spacebar** locks altitude, allowing you to pilot the camera without changing the camera's height (Z-axis lock).

You can adjust the Move Speed blue bar in the Scene Info & Controls panel. This setting is persistent across sessions.

Camera Information			
541712.626178	6902589.079441	178.313961	Scene Position
-28.001228	153.424245	178.313961	Lat, Long & Alt
-36.81	2.81		Heading & Pitch
	1093.321 m/s		Move Speed

In addition to mouse/keyboard controls, the camera can also be moved using an Xbox Controller or equivalent gamepad/controller device.

Default Gamepad Controls

- **Left Analog Stick** Move forwards, backwards and strafe left and right at the current move speed
- **Right Analog Stick** Rotate Camera (look around)
- **Left Trigger**: Move Down (lower altitude) at the current move speed
- **Right Trigger**: Move Up (higher altitude) at the current move speed
- **A Button** Toggle Lock Altitude
- **B Button** Slow down camera (x0.5)
- **Y Button** Speed up camera (x2)
- **X Button** Swaps between left and right viewports

Note: Development testing is done using a Microsoft Xbox 360 controller, these controls might be mapped differently on other brands or styles of controllers.

Default Hotkeys

- **F5**: Toggles full screen mode on and off.
- **Ctrl+U**: Opens a popup for adding additional files.
- **Delete**: Removes the selected items from the scene

Copyright and Compass

Copyright data will be displayed in the bottom-right corner of the viewport. You can add Copyright Data to new models in the metadata textbox during conversion.

Settings



Here is where you can customise how the udStream looks and operates.

To restore all default values for any of these settings, simply click on the area on the left and then select "Restore Defaults" at the top.

The settings are grouped into categories down the left side of the pop-up.

Appearance



The Appearance values enable you to adjust several settings that change the appearance of the udStream interface.

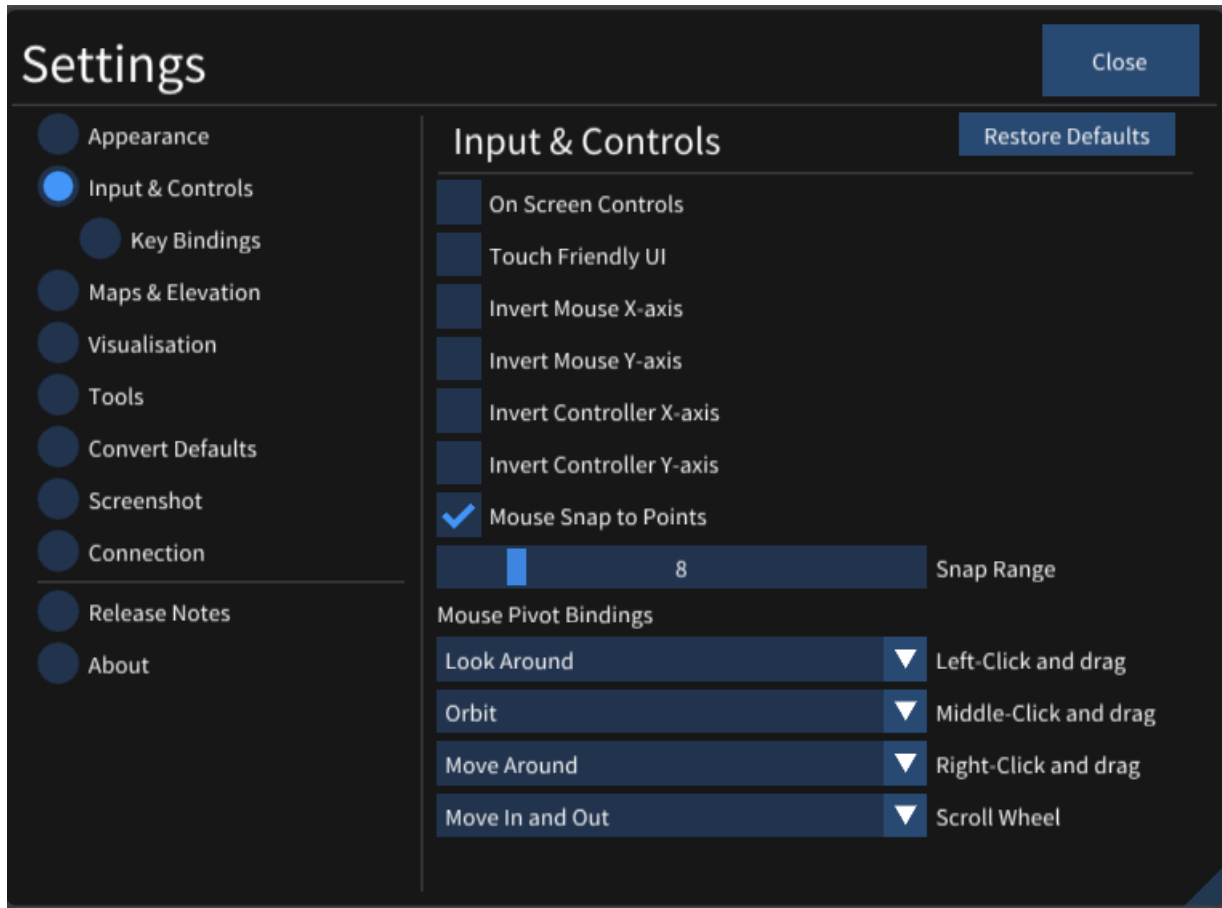
- **Language** changes the language of the application. Please note that many of the language selections are translated using machine translation.
- **Application Complexity** removes elements to provide a simpler or less cluttered experience.
- **Units of Measurement** sets the measurement system to use. Currently Metric and US Survey are supported.
- **Show Camera Information** will display camera information such as latitude/longitude, heading/pitch and camera speed in the top left of the [scene](#).
- **Show Projection Information** enables the display of projection information including the SRID and the mouse position in the top left of the [scene](#).
- **Show Euclidean Logo** will display the Euclidean logo at the bottom left of the [scene](#).
- **Show Advanced GIS Settings** enables the display of the advanced GIS settings in the top-right corner of the scene. This can be used to force the camera into a particular SRID.
- **Show Diagnostic Information** Check the box to display diagnostic information throughout the application. Such as the frame rate. The system will display the frame rate in frames per second (FPS) and milliseconds (ms) on the top menu bar next to the license and username information. Diagnostic information for Live Feeds includes Total Cached Items, Number of items displayed, Next Update.
- **Maximum Label Distance** controls the maximum distance at which Labels (from Points of Interest, [measurements](#), [Places](#), [GTFS](#), etc) are visible. If this value is low, you will not be able to see those labels when zoomed further away. This is useful both to improve performance and also to declutter the scene.
- **Image Rescale Distance** Media nodes (images, panorama's and photospheres) will start to shrink and disappear when this distance away from the camera.
- **Limit FPS In Background** Enable this to limit the frame rate when the application does not have input focus. This will reduce the impact of udStream while actively using other applications. This will not slow down conversion jobs.

- **Show Native Dialogs** Show your operating system's native dialog windows when you save or load a file.
- **Layout** Choose which side of the screen you would like the Scene Explorer.

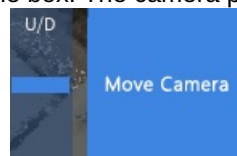
For settings that are controlled via a slider, you can press Ctrl+click on the slider and manually enter a value, allowing you to enter a more precise value or, in some cases, extend the slider value beyond its min and max range.

Input and Controls

Expanding this panel allows you to change settings that affect how you interface with the udStream.



- **On Screen Controls** You can toggle on-screen mouse controls, which will appear at the bottom-left of the Scene window. Click and drag the blue bar in the U/D box to move the Scene up or down. Click inside the Move Camera box and drag the mouse out. You will see a line appear from within the box. The camera position and rotation is controlled



by how far you draw out and in which direction you drag this line.

- **Touch Friendly UI** You can enable udStream to recognise touchscreen devices.
- **Invert Mouse X-axis & Invert Mouse Y-axis** Check to invert the default camera movement when you drag the mouse along the X and Y axes.
- **Invert Controller X-axis / Invert Controller Y-axis** Check to invert the default controller axis.
- **Mouse Snap to Points** Have the mouse snap to points.
- **Mouse Pivot Bindings** You can customise the mouse-controlled camera movements. Find the descriptions of the different mouse pivot bindings in the Default Mouse Controls section.
- **Keep Camera Above Ground** Checking this will ensure the camera will never go below the maps surface (if they are enabled).

To enable/disable maps, see section "Maps and Elevation".

Key Bindings

This section allows you to set up your own key bindings. Simply click an action to want to bind and press the key you want have bound.

Key Bindings			Restore Defaults
Name	Key Combination	Description	
CameraForward	W	Key to move camera forwards.	
CameraBackward	S	Key to move camera backwards.	
CameraLeft	A	Key to move camera to the left.	
CameraRight	D	Key to move camera to the right.	
CameraUp	R	Key to move camera upwards.	
CameraDown	F	Key to move camera downwards.	
DecreaseCameraSpeed	[Key to set cameras speed to 0.1x	
IncreaseCameraSpeed]	Key to set cameras speed to 10x	
Remove	Delete	Deletes all selected items from the scene.	
Cancel	Escape	Key to trigger cancel or close action.	
LockAltitude	Space	Toggles altitude lock, preventing up/down movement	

Maps and Elevation

The map feature is useful when you need a geospatial view and are unfamiliar with the area or are looking for a specific reference point. Select Map & Elevation within the Settings tab.

Settings

- Appearance
- Input & Controls
- Key Bindings
- Maps & Elevation**
- Visualisation
- Tools
- Convert Defaults
- Screenshot
- Connection
- Release Notes
- About

Maps & Elevation

☒ Map Tiles
 ☒ Digital Elevation Model
 ☒ Keep Camera Above Ground

Map Layers

Layer: 1

Base Map

Map Height
 Opacity
 Max Depth

Layer: 2

- **Map Tiles** Toggles the map system. Enabling the mapping system will increase network usage.
- **Digital Elevation Model** Adds height data to the map system. Enabling the map height data will increase network usage.
- **Keep Camera Above Ground** Keeps the camera above the ground, pivoting or otherwise moving around the scene.
- **Map Layers** Allows you to superimpose up to 3 types of maps over the scene terrain.

- **Base Map** Choose from a pre-configured set of map servers. ADVANCED: Checking the "Custom" option will show further options, allowing you to configure your own tile server URL.
- **Map Height** Offset vertically the map tile positions.
- **Opacity** Transparency of the map tiles.
- **Map Depth** The higher the map depth, the more detailed the map tiles will be.

Hold down the Ctrl-key and click in any parameter that has a slide bar to manually set a more precise value or set a value outside the parameter boundaries.

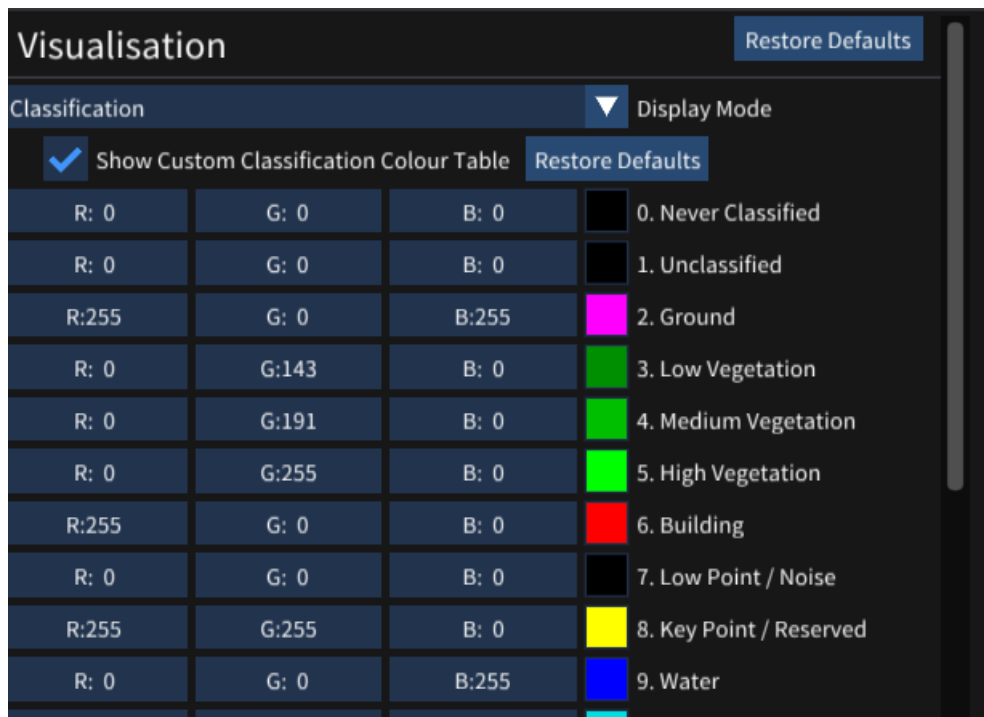
Visualisation

The Visualisation panel allows you to change some of the visual aspects of udStream, as well as visualise your data in different ways.

Display Mode


The Display Mode drop down list allows you to view the different types of data or 'channels' associated with your datasets. This including Colour, Intensity, Classification and Displacement, GPS Time, Scan Angle, Point Source ID Return Number and Number of Returns. Note: not all datasets will contain all these channels.

- **Colour** Colour is the default display mode.
- **Intensity** Intensity refers to the strength of the laser pulse that generated a point. Use 'Min Intensity' and 'Max Intensity' to set the intensity range you want to view.
- **Classification** In this mode, a checkbox appears which enables you to customise the colours of objects corresponding to their designated classifications.



- **Displacement Distance** Set the range at which you want to view the displacement between two models. You can also set the colours corresponding to maximum and minimum displacement, as well as set the colour for displacements outside of this range.
- **GPS Time** This setting allows you to visualise the times at which your data was scanned. Time is typically stored as a single number, representing the number of seconds since a specific point in time, or 'epoch'. For most laser scans, this is typically 'GPS Time' or 'Adjusted GPS Time'. GPS Time is the number of seconds since the midnight the 6th of January 1980, and GPS Adjusted Times is GPS Time minus one billion. You will need to tell udStream how to interpret this number, by choosing either choosing GPS or GPS Adjusted from the dropdown box. You can also set the range of time you wish to visualise.
- **Scan Angle** For data sets created by a laser scanner, the scan angle is the angle at which the laser leaves the scanner, from -180° to 180°, where 0° is directly in front of the scanner. You can refine the range by adjusting the Minimum Angle and Maximum Angle.
- **Point Source ID** Sometimes, each point in the dataset may have an associated number, or ID to identify where the data came from. This could mean any number of things but commonly is linked to the location of the dataset. Follow these steps to build up a list of IDs you want to visualise:
 - Set 'Next ID' to the ID you want to register

- Set the colour associated with this ID
- Press 'Add' to add the ID to the list of currently registered IDs.

Any IDs that are not registered will use the 'Default Colour.' You can remove an ID by pressing the  next to the list item. Click Remove All to clear the list.

- **Return Number** A laser pulse can return up to 6 times when scanning a feature. It is sometimes useful to know which *return number* is associated with each point in the dataset. In this display mode, you can associate a different colour with each return number.
- **Number of Returns** This signifies how many times the laser pulse was returned when scanning a feature. There is a maximum of 6. The colour of each can be set in this display mode.
- **Custom Attribute** This allows for the visualisation of scalar attributes of the model using a linear mapping to a number of preset schemes. This can be applied to any attribute present in the dataset. Selecting this mode will open the following submenu:



Before using the feature the **attribute name** and **slider range** need to be set to one appropriate to the attribute being visualised.

The colour scale will be applied linearly along the range defined by **min** and **max**. The colour mapping can be optionally repeated to achieve a contour effect using the **repeat scale**. Colour scales ending in a capital O (e.g. BrocO) are best used with when creating contours in attributes to create smooth transitions between repetitions.

To determine the range of values that a scalar value in a particular model for setting the min and max, first open the model in the **scene explorer** by clicking on the arrow next to the model name and scroll to find the values for **AttrMinMax** in the model properties:

Other Visualisation Settings

- **Voxel Shape** Set the shape of voxels in the Scene window as either points, rectangles, or cubes. Euclidean recommends rectangles for accuracy and performance.
- **Camera Lens (fov)** Field of View. This controls the horizontal extents of the scene displayed on the screen.
- **Saturation** Used to control the colour saturation of the scene.
- **Skybox Type** This changes the visualization of the sky and surrounding atmosphere. The options include:
 - **None** The sky will be displayed black
 - **Colour** Set your own sky colour
 - **Simple** A simple texture of a blue sky with clouds
 - **Atmospheric** atmospheric colouring, taking into account the time of day. You can adjust the time of day, time of year and the brightness of the sun.
- **Sun Brightness** Use the blue bar slider to change the sun brightness effect applied to the scene.
- **Use System time for sun position** Sets the sun's position based off the users local time.
- **Lock time to camera position** Sets the scene to always be day time.
- **Time of Day & Time of Year** Set the sun position to a specific time and day.
- **Enable Selected Objects Highlighting** Selected objects will now be highlighted in the scene, using the specified Highlight Colour and Highlight Thickness.
- **Enable Edge Highlighting** Highlights the edges of every voxel in the scene, using the specified width and colour. The threshold determines how to resolve the edges of overlapping voxels.
- **Enable Colour by Height** Displays colours along the specified two-colour gradient to all objects in the scene based on their height.
- **Enable Colour by Distance To Camera** Displays colours along a one-colour gradient to all objects in the scene based on their distance from the camera.
- **Enable Contours** Displays elevation contours depicted by Contour Colour on all objects. Contours Band Height is the width of the Contour Distances in the vertical space between each contour.

The last five display options also allow you to customise the colours.

☒ Enable Selected Objects Highlighting

R:236

G:141

B: 67

A:255

Highlight Colour

2.000

Highlight Thickness

☒ Enable Edge Highlighting

1

Edge Highlighting Width

2.000

Edge Highlighting Threshold

R:255

G:255

B:255

A:255

Edge Highlighting Colour

☒ Enable Colour by Height

R: 0

G: 0

B: 0

A:255

Colour by Height Start Colour

R: 0

G:255

B: 0

A:255

Colour by Height End Colour

30.000

Colour by Height Start Height

50.000

Colour by Height End Height

☒ Enable Colour by Distance to Camera

R:255

G: 0

B: 0

A:255

Colour by Distance to Camera Colour

100.000

Colour by Distance to Camera Start Depth

1000.000

Colour by Distance to Camera End Depth

☒ Enable Contours

R: 0

G: 0

B: 0

A:255

Contours Colour

50.000

Contours Distances

1.000

Contours Band Height

1.000

Rainbow Repeat Distance

0.000

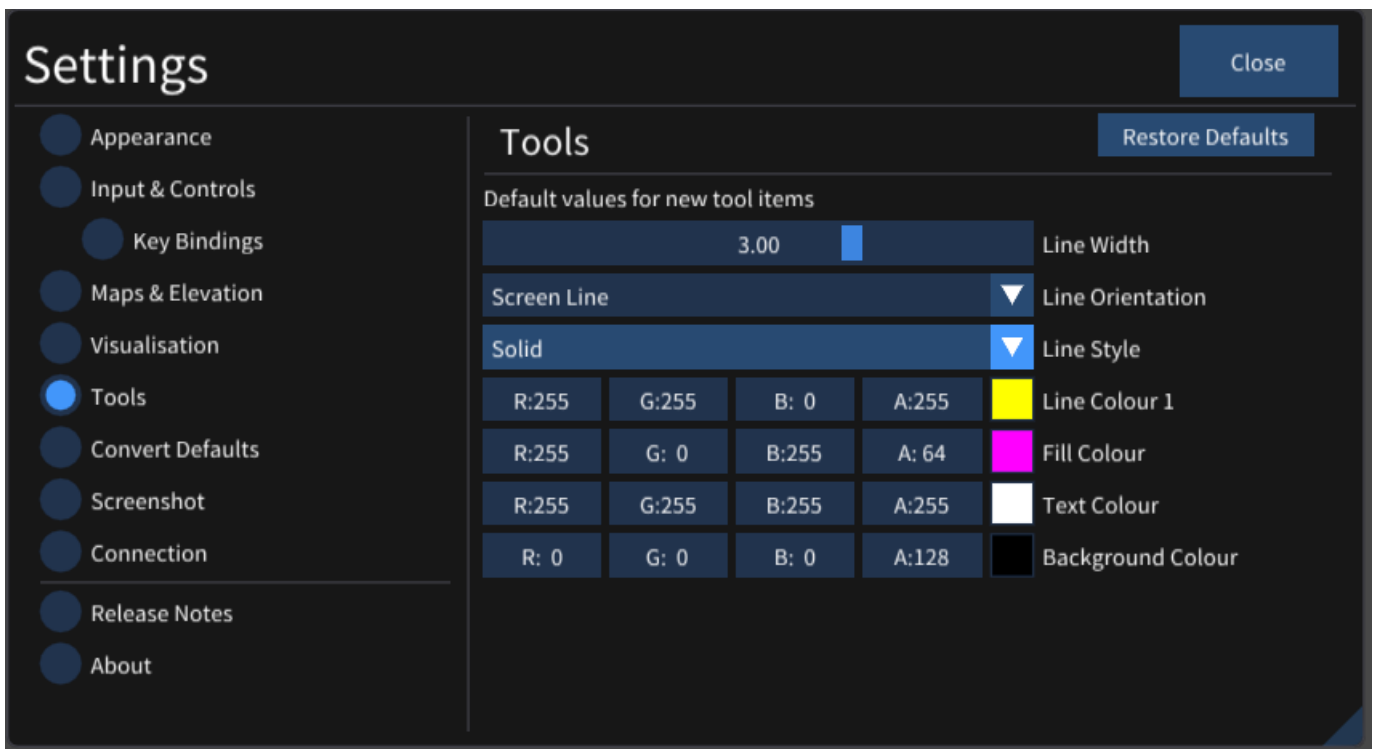
Rainbow Intensity

If you changed a setting and can't recall what you've changed, you can reset all settings by going to the System menu and selecting Restore Defaults, or you can reset individual groups of settings by right clicking on their header in the Settings Window and selecting Restore Defaults.

All parameters in the Settings Window are persistent across sessions: If you log out and log back in, the system will restore your settings from the previous session.

Tools (Default Settings)

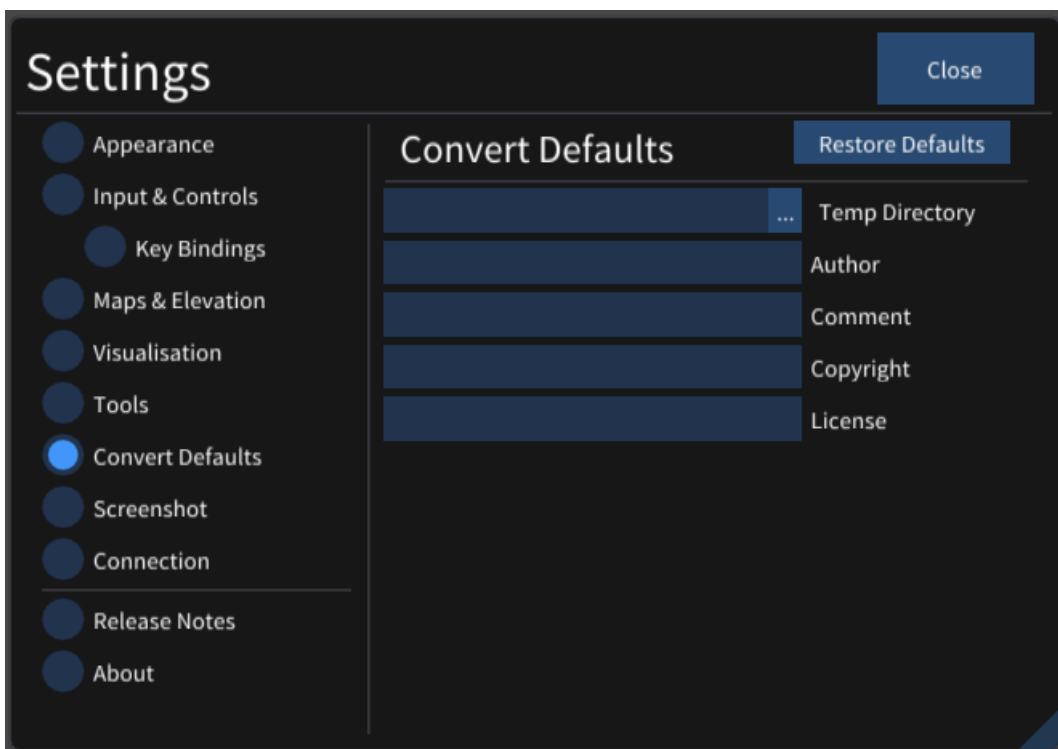
Here you can set the default settings for the udStream tools.



- **Line Width** Set the line width for all new line measurements you add to the scene.
- **Line Orientation** Set the line orientation for all new line measurements you add to the scene.
- **Line Style** Choose whether you want new measurements to be placed as screen lines, fences, or horizontal paths.
- **Line Colour** Set the line colour for all new line measurements.
- **Text Colour** Set the text colour for all new line measurements.
- **Background Colour** Set the text background colour for all new line measurements.

Convert Defaults

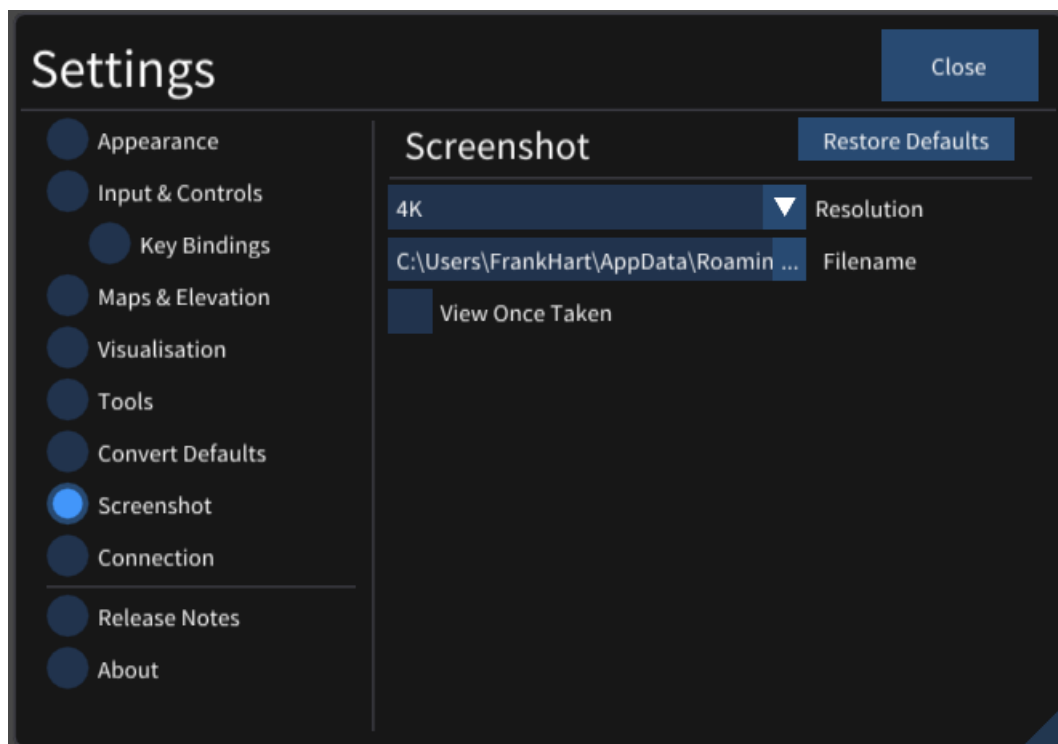
Converting is a process where a point cloud or 3D model is converted into Euclidean's own file format, UDS. In this section you can set some default settings when you convert your files.



- **Temp Directory** The process of conversion requires temporary files to be written to disk. You can set the location here.
- **Author, Comment, Copyright and License** These are optional fields you can add as metadata to your dataset when you convert.

Screenshot

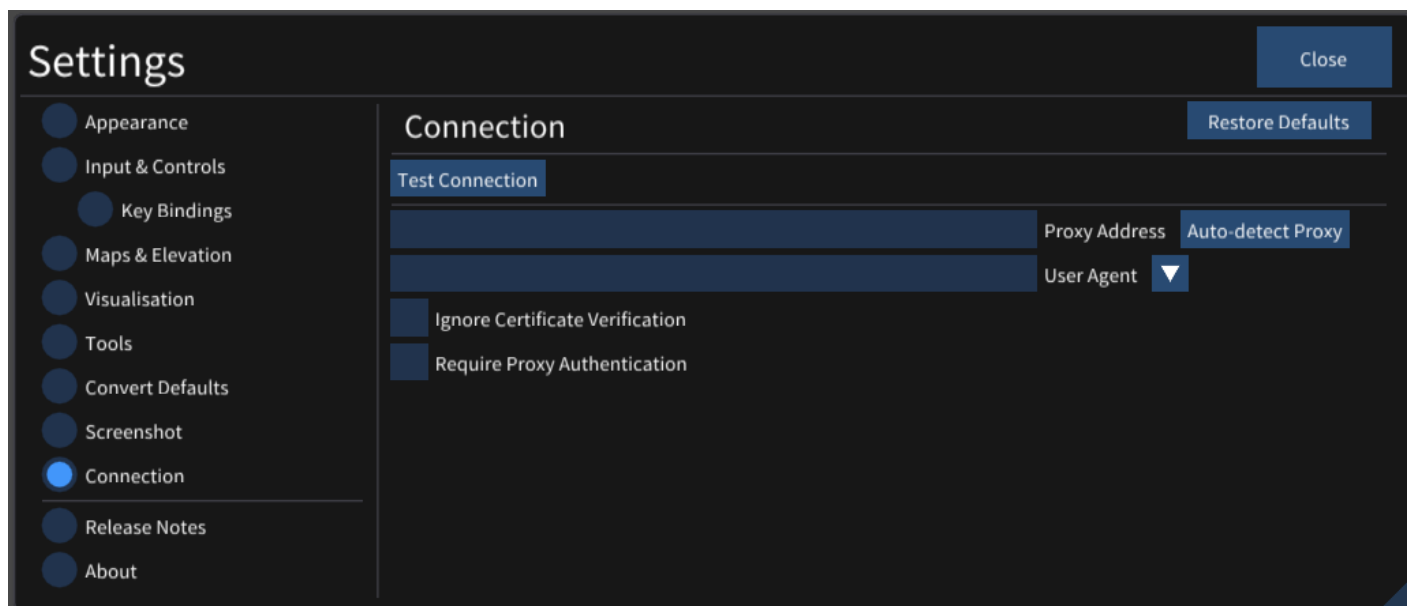
Pressing the PrtScn Key will take a screenshot of the current Scene Viewport and place it into a folder of your choosing.



- **Resolution** Set the resolution of your screenshots
- **Filename** Choose the path you wish to save your screenshots
- **View Once Taken** Display the image in a separate window each time you take a screenshot

Connection

Here we can set various connection settings.

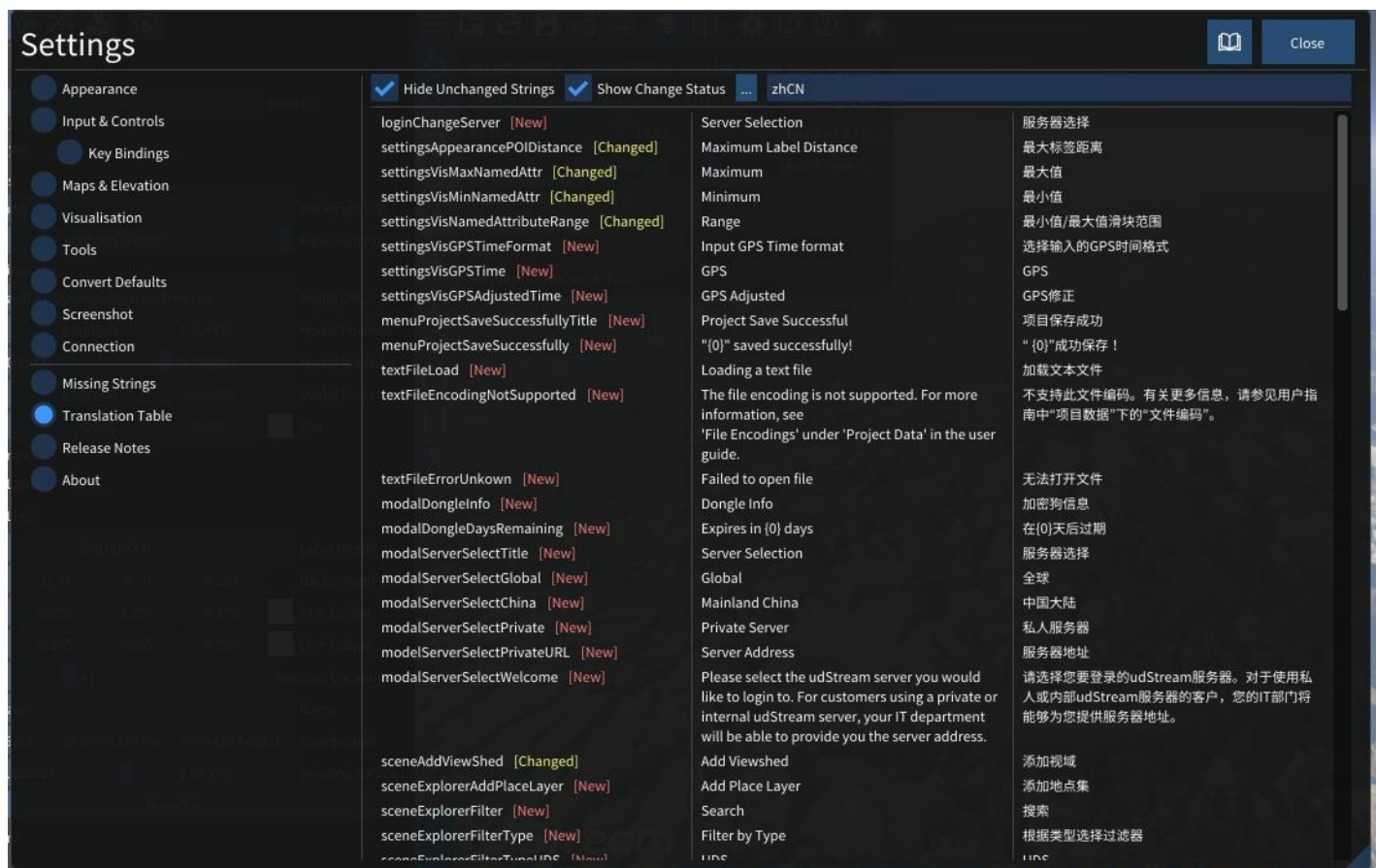


- **Proxy Address** The address for your internet proxy (this is provided by your system administrator). It can additionally include the port number and protocol. Examples include: 192.168.0.1, 169.123.123.1:80 or https://10.4.0.1:8081. Leaving this blank will attempt auto-detection.
- **User Agent** A field included in HTTP request headers. Very few users will need to specify this setting.
- **Ignore Certificate Verification** Will disable verification of the PEER and HOST certificate authorities. This setting should only be used when instructed by your system administrator and only when errors are occurring during the login process, as it will weaken the security between your computer and the udServer. NOTE: Ignore Certificate Verification will not be saved due to the security risk associated. You will need to enable this setting each time you open the application.
- **Require Proxy Authentication** If you require Proxy Authentication, Set the username and password here.

Translations

This option is only available with "Show Diagnostic Information" enabled in Appearance

This is a helper system for the community to work to improve the translations.



There are three columns;

- The left-most column displays the key for the string
- The middle column is the current translation in the official language pack ("Australian English" or en-AU).
- The right-most column is the current translation in the language pack specified at the top. Clicking in this column will open the editor for that string, pressing Enter or clicking away will submit the translation.

The "..." button provides quick access to the included language packs or a new language pack can be created by entering the code in the text field at the top.

- **Hide Unchanged Strings** will hide strings that didn't change in the most recent release.
- **Show Change Status** will display some information at the end of the key based on the status of that key in the most recent release (versus the release before that)
- "New": The string is new in this release and will need to be translated
- "Changed": The string was changed in the official language pack in this release and may no longer be the correct translation
- "Same": The string was unmodified in this release

At the very bottom (under the 3 translation columns) there is a section showing keys that no longer exist in the official language pack- these can be safely removed. Clicking "Remove all deleted" will remove them from the table above (you must still click "Save" before the on-disk version is updated).

After you are happy with your modifications, you can click "Save" to save the new translations to file. These language packs are stored in the assets/lang directory of the application, you are welcome to submit the pack back to support@euclideon.com to be included in the next release!

Note! The language pack will not reload automatically, you must go back to "Appearance" and click the language from the drop-down again for your changes to apply.

Settings On Disk

We mentioned in Visualisation that your interface settings are persistent across sessions, and this is because udStream stores that information in a settings.json file, the location of which is dependent on your operating system.

- **Windows:** %AppData%/Roaming/Euclidean/client/settings.json
- **macOS:** ~/Library/Application Support/euclidean/client/settings.json
- **Linux:** ~/.local/share/euclidean/client/settings.json

Viewsheds



A view shed is the set of all points that are visible from a location. It includes all points that are in direct line of sight to the location and excludes points that are obstructed by terrain and other features.

To add a viewshed in the scene, right-click a point in the scene, choose Add New Item and then Add View Shed . It should look something like below, where visible points are green and hidden are red. You can change the colour of visible and hidden points, as well as set the projection distance in the scene explorer.



▼ View Shed

384.462160

Distance

R: 0

G:255

B: 0

A: 69

Highlight Visible

R:255

G: 0

B: 0

A: 69

Highlight Hidden